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P4.018 LHCD launcher study in KSTAR

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It is planned to upgrade the source power of LHCD system to 4 MW in KSTAR for 2021. The system is divided into four sub-systems, which are microwave sources (klystron), high voltage power supplies, transmission lines, and antenna. The conceptual design of each sub-system has been completed. The base design of antenna for 4 MW power is passive active multijunction (PAM) type launcher on the outboard of a mid-plane. One module (0.5 MW) of antenna system including PAM launcher and RF dividing components was developed for the purpose of preliminary study such as a verification of the fabrication method, RF design proof, test of power limitation, accessibility check, and plasma coupling before full scale construction. PAM launcher and RF dividing components were fabricated and their low level RF characteristics have been measured using network analyzer. High power test and conditioning of them are ongoing in a test chamber to increase the power rating with the aim of application to 2018 KSTAR campaign. Although the basic antenna design is outboard PAM, study on launching position for efficient current drive and relevant antenna design is ongoing, e.g. benefits of high field side and top launching, relevant compact antenna design, directivity improvement, simplification of RF feeding line for mid-plane outboard launcher, etc. In this paper, introduction to conceptual design result of 4 MW KSTAR system, test and conditioning result of prototype PAM, and study on compact LHCD antenna adopting standing wave slotted waveguide array with PAM will be presented.

Presenter: KIM, Jeehyun (NFRI)**Session Classification:** P4